Development of a Desktop Nuclear Plant Operations Simulator for Graduate and Undergraduate Education

Executive Summary

The objective of this curricula development grant is to imbed dynamic simulations of nuclear power plants into undergraduate and graduate nuclear engineering educational programs. The Pitt Advanced Nuclear Training for Higher Education Reactor (PANTHER) desktop simulation system will be developed in a new graduate course and then used in both undergraduate and graduate courses focused on studying and modeling advanced pressurized water reactors (PWR).

The benefits of this work will be to provide an open source simulator framework for teaching, research, and development that will stimulate interactions between students, faculty, and practitioners, and provide better understanding of the operation of nuclear power plants. Knowledge of commercial nuclear plant operations is often cited by employers as one of the major missing competencies in new employees and even experienced engineers. The PANTHER desktop simulator will promote improved competency and address the NRC mission of rebuilding the national educational infrastructure in nuclear engineering.

This one-year grant will be to develop the initial simulator focused on selected primary plant systems and core of an “AP-1000 like” reactor, and use the simulator in the classroom for initial feedback as to its use for education and training. Testing and evaluation of software will be done in cooperation with the Westinghouse senior person in the proposal (David Helling). Follow-on projects will be to revise, extend, and evaluate the simulator in a series of graduate and undergraduate course offerings. The future sustainability of the project will come from the simulator’s integration into the standard course offerings of the University of Pittsburgh’s Swanson School of Engineering Nuclear Program and the promotion of its use to other nuclear engineering programs.

Principal Investigator: Steven P. Levitan, Levitan@pitt.edu